SOME ECONOMIC ASPECTS OF THE HEAT AND DROUGHT OF JULY, 1901, IN THE UNITED STATES.

BY

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Large sections of the United States east of the Rocky Mountains suffered from a prolonged spell of extreme heat and of drought during the latter part of June, and in July, of the present year. Meteorologically, medically, and economically, great interest attaches to this heated term. The meteorological and the medical aspects of the question are likely to receive the most attention. It is the purpose of this article to point out some of the ways in which this remarkable spell of weather affected trade, industry, and finance. The sources of information have been the weekly *Climate and Crop Bulletins* of the Weather Bureau, and the well-known trade journals, *Bradstreet's* and *R. G. Dun and Co.'s Review.* The first-named publication distinctly emphasizes the meteorological side; the two journals last named aim to present a true statement of trade conditions without any special prejudice in favor of meteorological controls.

Summarizing, in a very general way, the meteorological characteristics of this hot spell, it may be said that the excessive heat began during the last days of June, and continued with but little relief, except locally, to the end of July. Record-breaking maximum temperatures were observed at a large number of stations, readings of 100° and above occurring in many places for several days in succession during part of the month. The daily temperatures were quite commonly well above the average, the excess frequently reaching 5° to 10°, or more. During this prolonged spell of hot weather the rainfall was markedly deficient over many sections east of the Rocky Mountains, and hence there resulted a drought of far-reaching extent.

The crop conditions were, on the whole, satisfactory until about the middle of July, when corn began to show the injurious effects of the excessive heat and drought in the southwest. Locally, some damage was done to wheat and some to oats; while cotton also suffered more or less from drought over considerable sections of the cotton States. Occasional local rains—as during the weeks

ending July 22 and 29, for example—helped to make good a part of the damage to corn or cotton which had been caused by the drought. The chief interest, so far as the crops were concerned, centred in the condition of corn.

One effect of the extreme heat upon general trade was observable at the very beginning of the hot spell, in June, and continued more or less distinctly as a characteristic of the four weeks of July. This was a marked stimulation of retail trade in seasonable goods, *i. e.*, light-weight clothing; "white goods"; straw hats; outing shirts; summer shoes; sporting goods, and the like. So emphatic was this control that the distinguishing feature of the retail trade during more than one week was the "very large distribution of all classes of summer goods, induced by the hot spell." Another interesting point in this connection was that the continuance of the intense heat over much of the country had the effect of carrying the sale of summer goods beyond the usual time; of leading to "considerable re-orders for summer wear" from wholesalers, and thus of stimulating trade along these lines until late in July. Towards the middle of the month there was, on the whole, something of a general adjustment of business to the conditions of intense heat which had already prevailed for more than three weeks, as is reflected in a report from St. Louis, to the effect that business interests were "resolutely adapting themselves to conditions over which they can have no control."

Besides the stimulating effect of the hot weather just referred to, another effect—and this an unfavorable one—was emphasized from week to week in many of the trade summaries from different cities within the districts of intense heat. This was the curtailment of almost all branches of trade other than that in summer goods. This depressing influence is clearly described in a report from Boston, July 6, to the effect that "buyers have been few, and only necessities have prompted purchases;" or again, in another report from a later week, that owing to the limited stocks of dry-goods on hand considerable shopping on the part of buyers to find requisite supplies was necessary; "and with the daily temperature well up in the 90's this is something most buyers declined to do." That "shopping" was decreased by the heat, and that goods were ordered by mail instead, was a natural result of the torrid weather conditions, and was clearly brought out in a number of cases. The emphatic statement from Memphis, July 12, to the effect that business was "held in check by drought reports," and the one that "torrid weather conditions depressed retail trade in all lines," are

representative of many trade reports from city after city for two, three, or even four successive weeks in some cases. Intense heat, however, is not necessarily adverse to general retail trade, provided there are favorable crop prospects. This is clearly brought out in such reports as one from Chicago, where, in spite of the heat then prevailing, sales of fall goods were enlarged owing to favorable crop reports, and one from St. Louis, where the country trade was "sustained by the result of the wheat harvest." On the other hand, again, trade may not respond immediately even when crop prospects are good; for when the weather is fine and farmers are busy harvesting, they have little time for trade, which slackens in consequence. Thus, Minneapolis reports on July 12 that less merchandise was being shipped by jobbers, because the farmers were "taking advantage of the fair weather to finish their work and did not have time to get into town."

A study of the special characteristics of the weather over different sections of the country from week to week brings out details of great interest. Thus, during the second week of July, for example, business was reported as of a "midsummer character," *i. e.*, normal, in the east. This is certainly partly explained when we learn that the temperatures for the week were nearly normal, or were slightly lower than usual, over many of the eastern States. Reports of a marked improvement in trade came from a number of cities situated in districts where the temperatures for the week were not far from normal. The statement from Louisville is fairly representative: "A few recent days of nominal summer weather have given a spurt to retail trade." During the same week in the southwest, however, trade conditions were adversely affected by drought and hot weather, "which superinduced a tendency on the part of many to cancel orders previously given." The third week of the intense heat and drought thus affected not only the trade of that particular week, but led to the cancellation of orders given in previous weeks. These cancellations were chiefly of orders for agricultural implements, dry goods, hats, and foot-wear; they came from the districts of the Southwest or the South where corn or cotton had suffered severely from the drought, and they continued to come in as long as the drought lasted. This was naturally a disturbing factor in the trade conditions of many Western and Southern cities.

The heat of the first week of July "caused a practical suspension of industrial activity in many cities." "Numerous prostrations from heat caused humane employers to close their mills

during the most distressing hours, thus bringing about some restriction of business." At Pittsburg all the mills were "badly crippled by the hot spell," and similar reports came from Boston, Philadelphia, and other cities. Steel, tin-plate, and cotton goods were noted as especially affected by these shut-downs. In close connection with these voluntary shut-downs on the part of employers comes the effect of the hot weather upon the strike of the steel-workers in Pittsburg, one of the trade journals reporting that the striking employés were "mostly content to take a rest during the hot weather," and consequently were not so anxious that a settlement should be reached. *Bradstreet's* of July 20 makes an editorial comment regarding the strike which emphasizes this point still further. "The present strike situation," says that journal, "suggests several reflections. It would be easy to magnify its importance if account were not taken of the fact that the present movement is coincident with the time of the year when a heated spell exerts its effect upon the imaginations of men ordinarily regarded as calculating, and when holiday-taking is the rule."

The week ending July 22 brought local showers over portions of the drought-stricken districts; and although these showers were in most cases but scattering, and much more precipitation was needed to repair the damage already done by the drought, there was a noticeable improvement as regards crop outlook and business in the sections where the rains fell. A characteristic report from St. Louis, July 19, stated clearly enough that "the business situation hinged upon the question of rain." On the same day New Orleans reported, "There is evidence of a more healthy tone pervading all lines of business as a result of frequent rains." At Baltimore, however, trade reports note that the rains had been excessive in some sections, and business had suffered in consequence.

The week ending July 29 gave "good rains in the spring-wheat and northern corn-belt . . . [which] caused reverse movements and the growth of a better feeling." "Advices of lower temperature and moderate rains came as a great relief to business throughout the country"; "needed rains in Texas and the Gulf Region, and hot weather and rains in the South Atlantic Region . . . improved cotton-crop advices and trade reports in those regions."

The cattle, meat, dairy and produce markets all showed marked effects of the excessively hot weather, which was naturally "a disturbing factor in markets for perishable goods." At the very beginning of the hot spell the perishable nature of butter and eggs

caused a rise in price, which was well maintained. The shortened supply of milk, due to the drought, was another factor in advancing the price of butter, and also caused the shut-down of a number of sugar-of-milk factories. Fruits and vegetables became scarce throughout the drought-stricken districts, and advanced in price. Fruits were in some cases reported as dried on the trees. Because of the inferior quality, scarcity, and high prices of fruits and vegetables there was a great demand for canned goods, the prices of which at once tended upward. Had it not been for the drought, the year 1901 would probably have been a very poor one for packers and jobbers of canned goods, because a very heavy supply had been carried over from the previous season. At Boston the shoe and leather market at the end of June showed an advance in hides, partly "on account of the smaller number coming into market as a result of the decreased sales of fresh meat during the heated term."

The drought and consequent lack of pasturage in the Southwest led to record-breaking shipments of cattle and hogs to market at Kansas City. This rush to market began early in July, and the receipts at Kansas City for the month exceeded those of July, 1900, by 263,000 head. The cattle were not shipped because the market invited them, nor because the stock was in the best condition, but simply because of the inability on the part of the stockmen to feed the animals. This extraordinary rush of live stock resulted in an over-supply of young cattle. The market was so overstocked that buyers dictated prices—a fact which operated to the advantage of the packers. The situation in the hide market was much complicated, and tanners were helped to hold down the price of hides. Smaller requirements in the way of corn for fodder, and restricted subsequent arrivals of cattle, were expected. Throughout July the prices of live hogs and of pork products were much affected by the price of corn.

Of all the economic aspects of the heat and drought of July the greatest interest attaches to the prices of stocks and cereals. During the first few days of July the "oppressive weather conquered option traders to such an extent that speculation was curtailed." Wheat was "lower on liquidation, induced by good crop reports, and despite confirmation of the heavy deficit in the German crop, the poor French crop, and of the short yield in Hungary, with doubtful prospects in other countries of Europe." On the New York Stock Exchange there was very little activity. The Fourth of July holiday (Thursday) was extended through the week; the

"record-breaking temperature made one extra day desirable." The uncertainty about the corn crop, due to the injurious effects of the drought, justified "some hesitation on the part of investors in railroad securities."

One of the most important developments of the second week of July was "the rampant speculation in corn and oats, due to reports of exceedingly heavy damage in the Missouri Valley belt." Stocks were so excited, owing to the crop damage reports from the corn-belt, "that they disregarded the indication of a record wheat crop." "Bearish interests" were "prompt to proclaim that the total failure of corn was in prospect, with an attendant diminution of railroad traffic at the West." On the strength of such reports "the market broke badly." The heaviest declines came in the stocks of railroads which were likely to be affected by a partial failure of the corn crop in the Southwest. Atchison and Rock Island were good examples. The preferred stock of Atchison fell to 92¾, while the common stock sold down from 86¼ to 70. Rock Island declined from 151 to 132½. Reports that rain was likely to fall in Kansas caused a rally from the low figures. The market in cotton was "irregular and professional," weather conditions in Texas playing an important part in bringing about changes in prices.

The effect of the weather conditions—real or speculative—of the week ending July 20 upon the prices of the staple products was very interesting. "It has been a weather market for the cereals," says one trade journal. The week began with a severe break in corn, "but quotations hardened again as the week advanced on reports that the rains falling have only afforded partial relief. The close of the week again finds both cereals (wheat and corn) at top prices, that for corn being the highest for years." The situation was, however, "relieved by moderate rains at many points, and also lower temperature." The cotton-crop outlook was reported as greatly improved by rain. "More encouraging weather reports, and less interest by exporters, were the chief depressing influences" on the price of cotton. In spite of the short corn crop, the large wheat yield made it evident that the cereal production of the West, as a whole, would furnish abundant traffic for the railroads. The appearance of rains in certain parts of the West led to considerable repurchasing of railroad stocks by capitalists who had sold Granger and Pacific stocks on the unfavorable crop outlook of two weeks before. Thus, there was considerable investment buying of Atchison preferred stock on the news of rain in Kansas and the expectation that at least a moderate corn crop would be secured in that

State. The common stock rose from 68½ to 78½. Rock Island was a very strong feature, "and the Grangers generally responded promptly to the improvement in the corn-crop outlook."

The high prices of corn in this country during the week ending July 27 had their natural effect upon the amount of that cereal exported by other countries, which reaped the "benefit of high prices made in this market." Argentina sent "a million bushels more than the United States, and Danubian ports nearly as much." Stocks moved vigorously all the week, "declining on Chicago's advices of heat in the corn-belt, and rallying when the drought was reported broken." The highest non-corner prices paid for corn since 1894 were paid during the week at Chicago and New York. Stories of damage by heat and drought to other cereals made the three great staple crops—corn, wheat and, oats—move up sharply together. Reports of scattered rains caused a reaction from the high prices. Little attention was paid in the New York stock market to any news except that relating to corn-crop conditions, because of the general impression that the serious reduction in the yield would materially affect many railroads. The direct loss to the railroads in the diminished tonnage of corn itself is naturally an important item; but there is also a falling-off in the general business of the districts affected by the drought, and a corresponding diminution of the general tonnage of the roads. For some months confidence had been expressed in the increase of the Union Pacific's dividend rate on its common stock from 4 per cent., it being generally expected that the rate would be raised to at least 5 per cent. The drought and damage to crops in the territory tributary to the Union Pacific in Kansas and Nebraska "created an unfavorable feeling," and "raised strong doubts as to the possibility of any increase in the 4 per cent. dividend on the common stock." The corn-crop situation made the Granger and Pacific stocks the feature of the railroad share list. Union Pacific was one of the most prominent stocks in volume of transactions, and sold down very sharply from 104½ to 93¼. St. Paul fell from 164 to 152½, and the other Grangers were proportionately affected. Unfavorable crop news led to some selling of Union Pacific "convertible fours." The cotton market exhibited considerable weakness, one factor in causing which was the precipitation in the States where moisture had been badly needed.

After about one month of intense heat and of drought the end of July and the first few days of August at last brought lower temperatures and good rains over most of the drought-stricken districts.

The relief to trade was immediate and general. The rains throughout the western half of the country had "the expected effect of inducing a more cheerful tone," and the feeling was decidedly more hopeful than a week or more before. In the great corn States a much larger proportion than usual of the year's crop had been planted late, and this late corn experienced a general improvement, although the early corn was practically ruined. A large spring-wheat crop was practically assured by the rains. Cotton-crop conditions at the South also improved, and trade reports were consequently more cheerful from Southern cities.

An abundance of forage supplies for cattle was now certain. The Western farmers, therefore, regained courage, and the rush of cattle and hogs to market stopped. Cattle receipts at Kansas City fell off 25,631 from the preceding week. The pressure in this line being removed, many of the cattle which had been sent to market were not slaughtered, but were kept to be fattened for the dressed-meat market. Hence a great accumulation of skins was no longer expected.

The most unfavorable trade reports naturally came from the Central West and Southwest, where the loss from drought had been greatest. Kansas City reports that anxiety had been followed by "a feeling of relief and hopefulness;" cancellations had stopped, and country merchants had taken new courage. The bank clearings for July at Kansas City were the largest on record, on account of the heavy receipts of cattle and hogs. For the country as a whole, July bank clearings were limited, as might be expected, by the "intense heat and drought."

In the New York stock market the break in the drought was followed by a general improvement in quotations for railroad shares. Support was given Southern Pacific on the theory that a dividend on that stock was more likely because of the possible diminution of the Union Pacific's earnings, resulting from a reduction of the corn crop. The news of rain in the West caused decided sharp advances in the leading Granger and Pacific shares. Union Pacific advanced from 98⅞ to 101½, and nearly all of the securities which had been affected by speculative bear-selling, on the reports of damage to crops, also rose. St. Paul advanced from 160½ to 163⅜, and Missouri Pacific rose from 98 to 102¼. Southern Railway preferred and common stock developed "a certain amount of heaviness," because of the feeling that a smaller cotton crop would unfavorably affect the earnings of that road.

Fluctuations in corn continued, as conflicting reports of greater

or less loss were given currency. Good spring-wheat crop reports and liberal arrivals at interior cities weakened prices of that staple. Cotton was weaker, owing to the arrival of needed rains. Meats were firmer as western shippers became less frightened, and reduced the movement of cattle. Dairy products still continued high.

Under the influence of the extreme heat of the month, summer travel on railroads and steamships is reported as having been the heaviest in years, while the hotels in sections frequented by summer visitors did an excellent business. In the dry goods trade the July business did not come up to expectations, the market having "had to contend with unusually trying weather over the greater part of the country." There was, however, a feeling in dry goods jobbing circles that the crop scares, due to drought, would make the fall season later than usual.

Business was affected during July along many other lines than those already referred to. The number of failures in August was larger than usual, the disturbing influence of the July drought making itself felt during the following month. Building was interfered with, and trade in paints, oils, and other building requisites was checked. Meats were in less demand, and wholesalers in some cases reduced prices in order to move fresh meats in storage. The consumption of milk increased greatly; hence there was a scarcity in many cities, which was partly also owing to the fact that farmers kept their milk for cream instead of running the risk of its souring *en route* to the cities. The demand for ice was so great that there was difficulty in chartering enough vessels in which to ship the ice from Maine. The hot weather was unfavorable for the curing of fish; benefited turpentine farms; increased the sale of fruits and vegetables. And so on.

The examples above given show that excessive heat in some cases curtailed trade, because it kept people at home. In other cases it stimulated trade, because it prompted purchases of summer clothing and vacation supplies. These effects may be classed as direct. Again, in sections where high temperatures were needed for crops, the excessive heat promoted the growth of these crops, and thus induced a healthy feeling and improved business conditions. Or, in other sections where rain was needed, crops or farm produce suffered from drought; the outlook for farmers was poor, and hence trade suffered. Such effects as these latter may be classed as direct.

When the various places from which trade reports were received are divided into two classes, and the prevailing weather conditions are closely studied, it appears that in the majority of cases the key

to the state of trade is found in the weather. Trade is so carefully adjusted to the average weather conditions of any particular month that seasonable weather, other things being equal, usually means seasonable trade. When meteorological conditions are unseasonable, trade is quick to reflect the change. Trade, however, is subject to many and widely-varying controls; hence the problem of the particular controls which affect it in any one week is a very complex one, and the key is by no means always, or sometimes even at all, to be found in local weather conditions. The trade of a city, it must be remembered, is largely dependent upon orders coming from other sections of the country, often at a considerable distance. Hence, although the weather in the city may be unfavorable, and local trade somewhat depressed, orders from the tributary district may suffice to overcome this depression and keep trade up to the usual standard. Again, while a spell of seasonable weather promotes active trade among the inhabitants of a city, the farmers round about take advantage of this opportunity to work in their fields, and trade in the country districts suffers because the farmers are too busy to make purchases. Furthermore, the relation between temperature and precipitation and crops, and hence, indirectly, the control of these elements over trade, cannot be expressed in any simple way. If there has been sufficient rainfall, high, or even unusually high, temperatures may be just what are needed to promote the growth of crops; while, on the other hand, if the rainfall has been deficient, high temperatures may be very injurious. The proper distribution, in time and in amount, of temperature and rainfall in their relation to crops is a subject which still needs careful study.

The effects of the varying weather conditions of July upon the prices of cereals and stocks have been briefly noted. In considering these fluctuations in price it will, of course, be remembered that many reports of damage by, or of beneficial effects of, different meteorological conditions upon crops, and hence upon railroad earnings, are circulated by speculators in their own interest. It is, therefore, often almost impossible to distinguish the real from the speculative damage or benefit. A close study of the conditions of the stock market during July, however, shows pretty clearly that the speculative reports were really based upon facts of some damage, or of some benefit, to crops due to the weather. The real difficulty was that these reports were often greatly exaggerated. With all the speculation which was rampant during the month, many of the fluctuations in prices seem to have had a fairly reasonable foundation in the changing conditions of the weather.